



#09 2-295802/\$
Attorney Docket No. 29195-8162US

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Date: January 28, 2002

By: Peter [Signature]

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF:

Thomas L. Ritzdorf *et al.*

APPLICATION NO.: 09/018,783

FILED: February 4, 1998

FOR: **METHOD FOR FILING RECESSED
MICRO-STRUCTURES WITH
METALLIZATION IN THE
PRODUCTION OF A
MICROELECTRONIC DEVICE**

EXAMINER: D.M. COLLINS

ART UNIT: 2823

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**Supplemental Information Disclosure Statement After First Office Action but
Before Final Action or Notice of Allowance – 37 CFR 1.97(c)**

Commissioner for Patents
Washington, D.C. 20231

Sir:

1. Timing of Submission

The information transmitted herewith is being filed *after* three months of the filing date of this application or after the mailing date of the first Office action on the merits, whichever occurred last, but *before* the mailing date of either a final action under 37 CFR 1.113 or a Notice of Allowance under 37 CFR 1.311, whichever occurs first. The references listed on the enclosed Form PTO/SB/08A may be material to the examination of this application; the Examiner is requested to make them of record in the application.

2. Cited Information

☒ Copies of the following references are enclosed:

- ☒ All cited references
- ☐ References marked by asterisks
- ☐ The following:

☐ Copies of the following references can be found in parent application Ser. No.

02/14/2002 CUS111 00000004 09018783 180.00 32
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- ☐ All cited references
 - ☐ References marked by asterisks
 - ☐ The following:
- ☐ The following references are not in English. For each such reference, the undersigned has enclosed (i) a translation of the reference; (ii) a copy of a communication from a foreign patent office or International Searching Authority citing the reference, (iii) a copy of a reference which appears to be an English-language counterpart, or (iv) an English-language abstract for the reference prepared by a third party. Applicant has not verified that the translation, English-language counterpart or third-party abstract is an accurate representation of the teachings of the non-English reference, though, and reserves the right to demonstrate otherwise.
- ☐ All cited references
 - ☐ References marked by ampersands
 - ☐ The following:

3. Effect of Information Disclosure Statement (37 CFR 1.97(h))

This Information Disclosure Statement is not to be construed as a representation that: (i) a search has been made; (ii) additional information material to the examination of this application does not exist; (iii) the information, protocols, results and the like reported by third parties are accurate or enabling; or (iv) the cited information is, or is considered to be, material to patentability. In addition, applicant does not admit that any enclosed item of information constitutes prior art to the subject invention and specifically reserves the right to demonstrate that any such reference is not prior art.

4. Fee Payment (37 CFR 1.97(c)) or Certification (37 CFR 1.97(e))

- ☒ Applicant elects to pay the fee under 37 CFR 1.17(p) [\$180.00].
 - ☒ Check enclosed for \$180.00.
 - ☐ Please charge the above fee(s) to Deposit Account No. 50-0665; this paper is provided in triplicate.
- ☐ Applicant submits that no fee is due in light of the following certification under 37 CFR 1.97(e) (check only one):
 - ☐ In accordance with 37 CFR 1.97(e)(1), the undersigned hereby states that each item of information submitted herewith was cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to this filing of this statement; or
 - ☐ In accordance with 37 CFR 1.97(e)(2), the undersigned hereby states that no item of information submitted herewith was cited in a communication from a foreign patent office in a counterpart foreign application, or, to the knowledge of the person signing the certification after making reasonable

inquiry, was known to any individual designated in 37 CFR 1.56(c), more than three months prior to the filing of this statement.

- ☒ Please charge any underpayment for timely filing of this paper to Deposit Account No. 50-0665.

5. Patent Term Adjustment (37 CFR 1.704(d))

- ☐ The undersigned states that each item of information submitted herewith was cited in a communication from a foreign patent office in a counterpart application and that this communication was not received by any individual designated in 37 C.F.R. § 1.56(c) more than thirty days prior to the filing of this statement. 37 C.F.R. § 1.704(d).

Respectfully submitted,



Date: 28 Jan 02

Edward Hotchkiss
Registration No. 33,904

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Enclosures:

Check

PTO/SB/08A

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(use as many sheets as necessary)

FEB 11 2002

COMPLETE IF KNOWN

Application Number	09/018,783
Confirmation Number	1242
Filing Date	February 4, 1998
First Named Inventor	Ritzdorf et al.
Group Art Unit	2823
Examiner Name	Deven M. Collins

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U.S. PATENT DOCUMENTS

*EXAMINER INITIALS	Cite No.	U.S. Patent Document		Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		NUMBER	Kind Code (if known)			
Dmc		4,539,222		Anderson, Jr. et al	9/3/1985	
		4,687,552		Early et al	8/18/1987	
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		6,001,730		Farkas et al	12/14/1999	
		6,043,153		Nogami et al.	3/28/2000	
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✓		6,297,154 B1		Gross et al.	10/2/2001	

FOREIGN PATENT DOCUMENTS

*EXAMINER INITIALS	Cite No.	Foreign Patent Document			Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T
		Office	Number	Kind Code (if known)				
Dmc		EP	0 751 567 A2		Intl. Business Machines Corp.	1/2/1997		
		EP	0 881 673 A2		Intl. Business Machines Corp.	12/2/1998		
		EP	0 982 771 A1		Lucent Technologies Inc.	3/1/2000		
↓		WO	98/27585		Intl. Business Machines Corp.	6/25/1998		

EXAMINER

D. M. Collins

DATE CONSIDERED

3-22-02

* EXAMINER: Initial if reference considered, whether or not criteria is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant(s).

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

(use as many sheets as necessary)

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Application Number	09/018,783
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Examiner Name	Deven M. Collins
Attorney Docket No.	29195.8162US

Sheet

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of

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OTHER PRIOR ART-NON PATENT LITERATURE DOCUMENTS

*EXAMINER INITIALS	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume/issue number(s), publisher, city and/or country where published.
Dmc		STOYCHEV, D.S., TOMOV, V., VITANOVA, I.B., "Recovery And Recrystallization Of Electrodeposited Bright Copper Coatings At Room Temperature. I Microhardness in relation to Coating Structure", <i>Journal of Applied Electrochemistry</i> , 15, 879-886. Chapman and Hall Ltd. (1985).
		Harper, J.M.E., Rodbell, K.P., "Microstructure control in semiconductor metallization", <i>J. Vac. Sci. Technol. B</i> 15(4), pp. 763-779, Jul/Aug 1997.
		Gangulee, A., "The Structure of Electroplated and Vapor-Deposited Copper Films", <i>J. Appl. Phys.</i> , Vol. 43, No. 3, pp. 867-873, March 1972.
		Gangulee, A., "Structure of Electroplated and Vapor-Deposited Copper Films III. Recrystallization and Grain Growth", <i>J. Appl. Phys.</i> , Vol. 45, No. 9, pp. 3749-3756, September 1974.
		Gross, M.E. et al, "Microstructure and Texture of Electroplated Copper in Damascene Structures", <i>Materials Research Society Proceedings</i> , Vol. 514, 1998.
		Edelstein, D. et al, "Full Copper Wiring in a Sub-0.25µm CMOS ULSI Technology", <i>IEEE</i> , pp. 773-776, 1997
		Ryan, J.G. et al, "Technology Challenges for Advanced Interconnects", Date Unknown.
		Lowenheim, Frederick, "Electroplating", pp. 416-425, January 1979.
		Patent Abstracts of Japan 04-120290, 21 April 1992.

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